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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,471	01/15/2004	Min-Chul Suh	1514.1039	4143

49455 7590 09/13/2006

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EXAMINER

GARRETT, DAWN L

ART UNIT PAPER NUMBER

1774

DATE MAILED: 09/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/757,471

Applicant(s)

SUH, MIN-CHUL

Examiner

Dawn Garrett

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/15/04 & 7/20/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6-19-2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to the amendment filed July 20, 2006. Claims 1-16 have been amended. Claims 1-16 are pending. Applicant previously elected with traverse the species of an electron acceptor material that is an aromatic compound having a nitro group and the species of an electron donor material that is an aromatic compound having a hydrogen. As stated in the previous Office action, the examiner maintains that the species are distinct and require a separate search. The number of species to search is a serious burden, because the searches for the species are not coextensive.
2. The replacement Figure 3 drawing received July 20, 2006 is approved.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. The rejection of claims 2, 7, and 12 under 35 U.S.C. 112, second paragraph, is withdrawn due to the amendment and applicant's remarks.
5. Claims 11 and 12 are again rejected under 35 U.S.C. 102(b) as being anticipated by Fujita et al. (EP 1017118 A2). Fujita et al. exemplifies a device (Example 16, Table 3) comprising perylene (an aromatic compound with hydrogen) as a donor in an electron transporting layer (see page 22, abstract, and par. 75).
6. Claims 1-16 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. (EP 1017118 A2). Fujita et al. teaches organic electroluminescent elements comprising a light emitting layer between an anode and a cathode. Between the anode and the light emitting layer is a hole transporting layer containing a hole transporting material and an acceptor.

Art Unit: 1774

Between the light emitting layer and the cathode is an electron transporting layer containing and electron transporting material and a donor. (See Abstract). Materials for the acceptor include compounds having a nitro group such as TNF (trinitrofluorenone) and DNF (dinitrofluorenone) (see par. 48) per the elected acceptor species comprising an aromatic compound with a nitro group. The amount of acceptor to hole transporting material is 1 to 20% by weight (see par. 49) per claim 3. Fujita et al. teaches the thickness of the hole transporting layer is 100 nm (see Examples) per claim 5. With regard to the electron donor material, Fujita et al. teaches condensed polycyclic compounds such as pyrene, perylene, anthracene, tetracene, and pentacene (see par. 75) per the elected donor species comprising an aromatic compound with hydrogen. The amount of donor material to electron transporting material is 1-20% by weight (see par. 76) per claims 8 and 13. The electron transporting layer is made by a method such as spin coating method per claims 9 and 15 (see par. 77). Fujita et al. teaches an electron transport layer of 30nm thickness (see Examples) per claims 10 and 16. Although Fujita et al. fails to exemplify devices with all of the taught acceptor materials comprising an aromatic compound with a nitro group and donor materials comprising aromatic compounds with hydrogen, it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed a device as recited in the claims and to have selected the electron acceptor and electron donor materials under consideration, because Fujita et al. teaches all of the required components of the devices of the claims.

Response to Arguments

7. Applicant's arguments filed July 20, 2006 have been fully considered but they are not persuasive.

Art Unit: 1774

With regard to applicant's arguments over the election of species requirement, the examiner maintains that the species are distinct and require a separate search. The number of species to search is a serious burden, because the searches for the species are not coextensive.

The arguments with regard to the previous rejection under 35 USC 112, second paragraph, are now moot, because the rejection has been withdrawn in the present Office action.

With regard to the rejection under 35 USC 102(b) as being anticipated by Fujita et al. (EP 1017118), applicant argues Fujita does not disclose an electron injection layer as recited in independent claim 11. Applicant further argues "the only layers disclosed in Fujita as comprising 'an electron donor material' as recited in claim 11 are electron transporting layer 71". The examiner respectfully submits claim 11 as presently presented recites the following limitation:

"at least one of a hole blocking layer, an electron injection layer and an electron transport layer"

The examiner notes that an electron injection layer is not required by the claim as presently presented. Only *one* of the three types of layers is required.

Claim 11 further recites the following limitation:

"wherein the at least one of the hole-blocking layer, the electron injection layer, and the electron transport layer comprise an electron donor material" (see top of page 5 of current claim set)

The examiner notes that the claim does allow for the electron donor material to be present in the electron transport layer and only *one* of the three types of layers is required to have the electron donor material.

Art Unit: 1774

With regard to the 35 USC 103(a) rejection over Fujita, applicant notes "If Fujita does not disclose all of the features of claims 11-12 but the features of claims 11-12 missing from Fujita would have been obvious, the rejection under 35 USC 103(a) is appropriate and the rejection under 35 USC 102(b) is not appropriate. It is respectfully requested that the Examiner clarify which is the appropriate rejection." In response, the examiner notes that examples shown in Fujita are anticipatory and a 35 USC 102(b) rejection was set forth. In addition, the full disclosure of Fujita renders obvious selection of materials for further embodiments that read upon the present claims.

Applicant argues "Fujita does not disclose or suggest 'a hole injection layer comprising an electron acceptor material' as recited in independent claim 1 because it is not seen where any of FIGS. 1-14 of Fujita or any other portion of Fujita discloses 'a hole injection layer' as recited in claim 1." The examiner respectfully notes that claim 1 does not require a hole injection layer. Claim 1 sets forth the following limitation:

"at least one of a hole injection layer and a hole transport layer" The claim language "at least one of" only requires that *one* of the two types of layers be present. Accordingly, a hole injection layer is not required.

Claim 1 sets forth the following further limitation:

"wherein the at least one of the hole injection layer and the hole transport layer comprises an electron acceptor material" Again, the claim language only requires at least one of the two types and accordingly, a hole injection layer is not required.

Art Unit: 1774

Applicant further argues Fujita does not disclose an electron injection layer as recited in claim 11. The examiner respectfully submits claim 11 as presently presented recites the following limitations:

“at least one of a hole blocking layer, an electron injection layer and an electron transport layer”

The examiner notes that an electron injection layer is not required by the claim. Only *one* of the three types of layers is required.

Claim 11 further recites the following limitation:

“wherein the at least one of the hole-blocking layer, the electron injection layer, and the electron transport layer comprise an electron donor material” (see top of page 5 of current claim set)

The examiner notes that the claim does allow for the electron donor material to be present in the electron transport layer and only one of the three types of layers is required to have the electron donor material.

The present claim language does not clearly require a hole injection layer and an electron injection layer. The rejections over Fujita are respectfully maintained for the reasons of record.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 1774

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached at (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Dawn Garrett
Primary Examiner
Art Unit 1774